

# Weekly Report

2015/11/23-2015/11/29

## 1 Done

### 1.1 Project:

#### 1.1.1 Optimizing program structure

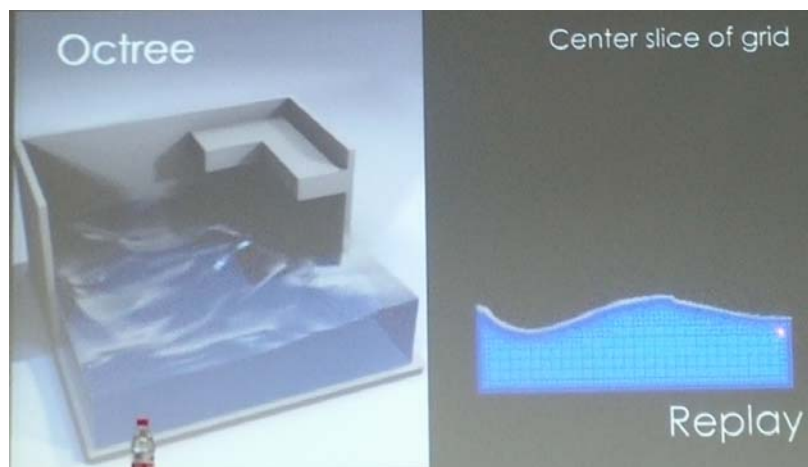
Refined the existing classes, so that we can debug more conveniently and quickly later.

#### 1.1.2 Debugging interfaces

### 1.2 Listening to the academic report:

In the reports, prof. Westermann introduced recent developments in the area of interactive numerical simulation and large data visualization at the Chair for Computer Graphics and Visualization at TUM.

Octree: the closer to the edges, the smaller the block is.



### Ray-based Compressed Rendering:

Big Data – Ray-based Compressed Rendering

High-performance sphere rendering

- Sphere centers are quantized into an adaptive binary voxel grid
  - Quantization error en par with data uncertainty
  - Blocks of 4x4x8 voxels are packed into 128 bit texels

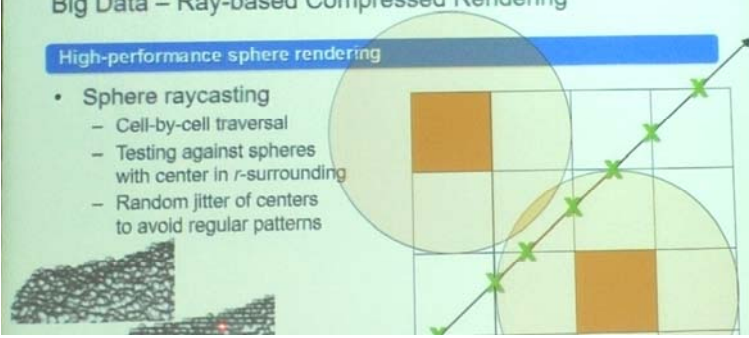
The diagram shows a 3D scene with three colored spheres (orange, blue, green) and a white cube. A ray is shown originating from a point and passing through the spheres. Below the 3D scene is a 4x4 grid of colored squares, representing the quantized voxel grid used for rendering.

Technische Universität München TUM

## Big Data – Ray-based Compressed Rendering

### High-performance sphere rendering

- Sphere raycasting
  - Cell-by-cell traversal
  - Testing against spheres with center in  $r$ -surrounding
  - Random jitter of centers to avoid regular patterns



2 To do

Complete the first edition of program.